

CLAIMS

What is claimed is:

1. An assay system, comprising:
a receptor for receiving a sample solution that may include at least one selected analyte;
a reaction zone in fluid communication with said receptor, said reaction zone including at least one reagent configured to produce a reaction mixture with said sample solution;
at least one detection zone in fluid communication with said reaction zone and configured to receive at least a portion of said reaction mixture transported from said reaction zone; and
a detector oriented to receive signals from said at least one detection zone and configured to sense a physically detectable change in said at least one detection zone, said detectable change correlating with at least one of an absence, a presence, and an amount of said at least one selected analyte in said sample solution, said detector configured to generate a signal correlating with at least one of said absence, said presence, and said amount.
2. The assay system of claim 1, wherein said at least one detection zone is carried by a substantially planar structure.
3. The assay system of claim 2, wherein said at least one detection zone is carried upon a surface of said substantially planar structure.
4. The assay system of claim 3, wherein said substantially planar structure comprises at least a portion of a planar waveguide.
5. The assay system of claim 2, wherein said detector is oriented to detect light emitted from said at least one detection zone.
6. The assay system of claim 5, wherein said detector is oriented to detect light emitted through said substantially planar structure.

7. The assay system of claim 5, wherein said detector is positioned within a cone of collection angles having an axis oriented substantially orthogonal to the plane of said substantially planar structure.

8. The assay system of claim 1, comprising a plurality of detection zones.

9. The assay system of claim 8, wherein said plurality of detection zones is carried upon a surface of a substantially planar structure.

10. The assay system of claim 9, wherein detection zones of said plurality of detection zones are positioned at discrete locations from one another on said surface.

11. The assay system of claim 10, wherein said discrete locations are arranged in an array.

12. The assay system of claim 11, wherein said substantially planar structure comprises a planar waveguide.

13. The assay system of claim 8, wherein at least two of said plurality of detection zones comprise different capture molecules capable of reacting with different analytes.

14. The assay system of claim 1, wherein said reaction mixture comprises a reaction product including said at least one analyte, said at least one reagent bound thereto, and a physically detectable label on said at least one reagent.

15. The assay system of claim 14, wherein said physically detectable label emits light when excited.

16. The assay system of claim 15, further comprising:
a source of electromagnetic energy of at least one wavelength capable of exciting said physically detectable label.

17. The assay system of claim 16, wherein said electromagnetic energy comprises an evanescent field.

18. The assay system of claim 1, further comprising:
a display for illustrating data representative of said amount of said at least one selected analyte in said sample solution.

19. A method for detecting at least one of an absence, a presence, and an amount of at least one selected analyte in a sample, comprising:
mixing said sample with a reagent to form at least one reaction product;
transporting said at least one reaction product to at least one detection zone for reaction of said at least one reaction product and at least one molecule of said at least one detection zone; and
detecting the reaction between said at least one reaction product and said molecules at said at least one detection zone.

20. The method of claim 19, wherein said transporting comprises bringing said at least one reaction product into the presence of at least one complementary capture molecule of said at least one detection zone.

21. The method of claim 19, wherein said mixing comprises permitting the at least one selected analyte and a corresponding reagent that includes a detectable label to bind to form said at least one reaction product.

22. The method of claim 21, wherein said detecting comprises sensing at least one of said detectable label and a signal emitted from said detectable label.

23. The method of claim 21, wherein said detecting comprises sensing a light signal emitted from said detectable label.

24. The method of claim 19, wherein said transporting is at least partially effected along a substantially planar structure.

25. The method of claim 24, wherein said transporting is at least partially effected on a surface of said substantially planar structure.

26. The method of claim 24, wherein said transporting is at least partially effected on a surface of a planar waveguide.

27. The method of claim 26, wherein said transporting comprises bringing a plurality of different reaction products into the presence of molecules of different detection zones on said surface.

28. The method of claim 24, wherein said transporting comprises bringing said at least one reaction product into the presence of molecules at a plurality of discrete detection zones on said substantially planar structure.

29. The method of claim 24, wherein said detecting comprises generating an evanescent field over at least a portion of a surface of said substantially planar structure.

30. The method of claim 29, wherein said detecting comprises sensing a light signal emitted from said at least one detection zone on said substantially planar structure.

31. The method of claim 29, wherein said detecting comprises sensing a light signal emitted from said at least one detection zone and at least partially through said substantially planar structure.

32. The method of claim 24, wherein said detecting is effected from a location within a cone of collection angles having an axis substantially orthogonal to the plane of said substantially planar structure.

33. The method of claim 19, wherein said detecting comprises detecting an amount of the at least one analyte present in the sample.

34. The method of claim 33, further comprising:
comparing said amount of the at least one analyte present in the sample to at least one calibration value.

35. The method of claim 33, further comprising:
visibly displaying data representative of said amount of the at least one analyte present in the sample.